

PRÜFZEUGNIS (Test Certificate)

900 6806 023/PZ-321-var/E *)

Auftraggeber:
(Client) Akzo Nobel Hilden GmbH
Düsseldorfer Straße 96-100
40721 Hilden

Betreff:
Subject Reaction to fire testing according to DIN 4102-1, "Baustoffklasse B1"

Prüfmaterial:
(Test material) Colorless coating system "Aqualit A-T280..." in various gloss levels, each with hardener "HWA6000" on „Aqualit A-IS180" applied to flame-retardant (DIN 4102-B1) chipboard - also veneered - as a flame-retardant building material (Baustoffklasse DIN 4102-B1)

Datum:
(Date) 30. October 2023

Gültigkeitsdauer:
(Period of Validity) until 31. October 2028

Hinweis:
(Notes) If the above-mentioned building material is not used as a building product according to MBO § 2, Para. 10, an „*allgemeines bauaufsichtliches Prüfzeugnis (abP)*" is not required.
This test certificate does not apply if the tested building material is used as a building product within the meaning of the building regulations of the federal states (MBO § 17, Para. 1).

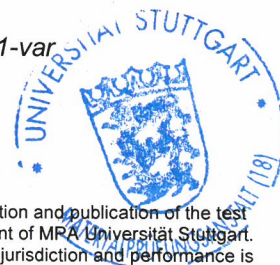
This test certificate does not replace a possibly necessary certification according to German building regulations.

This test certificate can serve as a basis in the building supervisory procedure:

- in the case of regulated building products for the required certificates of conformity
- in the case of non-regulated building products, for the required proof of usability.

The explanations in DIN 4102-1, Annex D, in particular on third-party inspection, are to be particularly observed.

*) This test certificate is the English version of our test certificate 900 6806 023/PZ-321-var dated 30. October 2023. In cases of doubt, the German version applies.

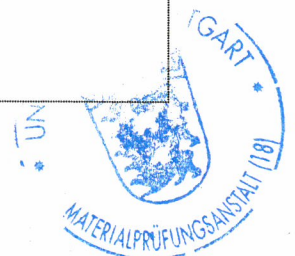


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1. Material description

Colorless coating system consisting of "A-T280..." in the gloss levels matt "...-10", silky gloss "...-40", silk matt "...-20" and high-gloss "...-90" in each case with the hardener "HWA 6000" on "Aqualit A-IS180" applied to flame-retardant (DIN 4102-B1) chipboard - also veneered.

Mixing ratio (by weight):	Top coating : Hardener 10 : 1		
Application rate (wet):	Top coating 2 x 120 g/m ²		
Type of application:	Compressed air spraying		
Field of application:	Interior fitting		
Trade name:	„Aqualit A-IS180“ „Aqualit A-T280...“ (...-10,...-20,...-40,...-90) „HWA6000“		
Receipt of samples:	a)	04. December 2019	(Receipt-No. 19/376)
	b)	17. March 2021	(Receipt-No. 21/163)
	c)	02. February 2022	(Receipt-No. 22/15)
	d)	05. December 2022	(Receipt-No. 22/258)
	e)	02. May 2023	(Receipt-No. 23/101)
Quantity:	a)	5 l „Aqualit A-IS180“ 5 l „Aqualit A-T280-90“ 2,5 l „HWA6000“	
	b)	5 l „Aqualit A-IS180“ 5 l „Aqualit A-T280-10“ 2,5 l „HWA6000“	
	c)	5 l „Aqualit A-IS180“ 5 l „Aqualit A-T280-20“ 2,5 l „HWA6000“	
	d)	5 l „Aqualit A-IS180“ 5 l „Aqualit A-T280-90“ 2,5 l „HWA6000“	
	e)	5 l „Aqualit A-IS180“ 5 l „Aqualit A-T280-10“ 2,5 l „HWA6000“	



2. Sample preparation

Samples of flame-retardant (DIN 4102-B1) chipboard, 1000 mm x 190 mm x 12 mm, were coated on one side with the varnish in the presence of an employee of the MPA University of Stuttgart in accordance with the manufacturer's instructions. The carrier boards were provided by the MPA.

For the B2 tests, 190 mm x 90 mm samples were cut from the coated chipboard samples.

3. Test procedure

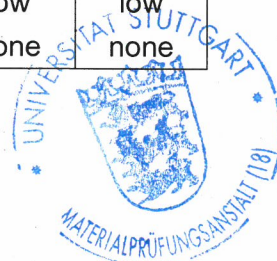
The tests had been performed according to standard DIN 4102-1: 1998, DIN 4102-16: 2015 and DIN 4102-16: 2021 using the Brandschacht according to DIN 4102-15: 1990 and the „Zulassungsgrundsätze für den Nachweis der Schwerentflammbarkeit von Baustoffen (Baustoffklasse DIN 4102-B1)“, issued by Deutsches Institut für Bautechnik, Berlin.

The fire test had been conducted on free-hanging samples without substrate.

4. Test results

4.1 Tests according to DIN 4102-1 clause 6.2, „Baustoffklasse B2“

Probe	Test:	1	2	3	
a)	Max. flame height within 20 s:	cm	5	4	5
	reached after:	s	15	15	15
	Smoke development:		low	low	low
	Burning droplets:		none	none	none
b)	Max. flame height within 20 s:	cm	5	4	5
	reached after:	s	15	15	15
	Smoke development:		low	low	low
	Burning droplets:		none	none	none
c)	Max. flame height within 20 s:	cm	4	5	4
	reached after:	s	15	15	15
	Smoke development:		low	low	low
	Burning droplets:		none	none	none
d)	Max. flame height within 20 s:	cm	4	4	4
	reached after:	s	15	15	15
	Smoke development:		low	low	low
	Burning droplets:		none	none	none
e)	Max. flame height within 20 s:	cm	5	5	4
	reached after:	s	15	15	15
	Smoke development:		low	low	low
	Burning droplets:		none	none	none



4.2. Test according to DIN 4102, clause 6.1 – “Baustoffklasse B1”

The fire shaft test (“Brandschacht”) A, B, C, D, E on the samples a), b), c), d), e)

were carried out on free-hanging specimens without any substrates.

4.2.1 Results of the fire shafts test („Brandschacht“) (part 1)

Line-No		Test Results of Specimen Assembly				
		A	B	C	D	E
1	<u>No. of fastening method</u> according to DIN 4102-15, table 1	7	7	7	7	7
2	<u>Max. flame height</u> above the lower edge of the sample cm	> 100	> 100	> 100	> 100	> 100
3	Time of appearance ¹⁾ min/s	2:20	1:35	3:00	2:15	1:35
4	<u>Occurrence of holes in the material</u> Time of appearance ¹⁾ min/s	-	-	-	-	-
5	<u>Observations of the reverse face of the specimen</u> Flames / Glowing Time of appearance ¹⁾ min/s	-	-	-	-	-
6	Discolouring Time of appearance ¹⁾ min/s	-	-	-	-	-
7	<u>Burning droplets</u> Beginning ¹⁾ min/s	-	-	-	-	-
	Continued burning on sieve tray s	-	-	-	-	-
8	Sporadically dripping sample material	-	-	-	-	-
9	Steady dripping sample material	-	-	-	-	-
10	<u>Burning dripping sample parts</u> Beginning ¹⁾ min/s	-	-	-	-	-
	Amount:					
11	Sporadically dripping sample material	-	-	-	-	-
12	Steady dripping sample material	-	-	-	-	-
13	Duration of continued burning on the sieve bottom (max.) min/s	-	-	-	-	-
14	<u>Impairment of the burner flame due to dripping/falling material</u> Time of appearance ¹⁾ min/s	-	-	-	-	-
	<u>Premature end of experiment</u>					
15	End of fire reaction min/s	-	-	-	-	-
16	on the specimen ¹⁾ Time of premature finishing the test, min/s	-	-	-	-	-

¹⁾ Elapsed time from the start of the test (t=0) shall be recorded



4.2.2 Results of the fire shaft tests (Brandschachtprüfung) (Teil 2)

Line-No		Test Results of Specimen Assembly				
		A	B	C	D	E
<u>Afterburning after the end of the test</u>						
17	Duration min/s	-	-	-	-	-
18	Number of specimen					
19	On front face of the specimen					
20	On reverse face of the specimen					
21	Flame height cm	-	-	-	-	-
<u>Afterglow after end of test</u>						
22	Duration min/s	-	-	-	-	-
23	Number of specimen					
	Location of glowing					
24	Lower half of the specimen					
25	Upper half of the specimen					
26	Front face of the specimen					
27	Reverse face of the specimen					
<u>Smoke density</u>						
28	$\leq 400 \% \cdot \text{min}$	17	9	14	16	9
29	$\geq 400 \% \cdot \text{min}$ (very strong smoke development)	-	-	-	-	-
30	Graph in annex No.	1	2	3	4	5
<u>Residual length</u>						
31	Single results of each specimen cm	10 / 20 20 / 20	19 / 21 21 / 18	20 / 20 19 / 20	15 / 17 15 / 16	18 / 17 18 / 19
32	Average of each specimen assembly cm	20 *)	20 *)	20 *)	16 *)	18 *)
33	Photo of the test assembly in annex No.	-	-	-	-	-
<u>Flue gas temperature</u>						
34	Maximum of the average value °C	149	155	164	144	168
35	Time of appearance ¹⁾ min/s	6:17	2:27	2:29	2:42	2:23
36	Graph in annex No.	1	2	3	4	5
37	Notes: Residual length of the non coated particle board: *) 18 cm Appearance of the samples after the fire tests: Back side intact					



5. Classification

All tested samples met the requirements for building materials according to DIN 4102, part 1, clause 6.1.2.2 and clause 6.2 for class B2.

Thus, the product as described in section 1 meets the requirements for building materials according to class B1 of DIN 4102-1:1998.

No sample parts fell off during the test according to DIN 4102-1:1998, clause 6.2.5 and according to DIN 4102-16:2021 neither burning nor glowing.

According to DIN 4102-16:2021, clause 10.3, the material is considered to be non-molten-dripping.

6. Notes

- 6.1 The containers of the coating system must be labelled according to DIN 4102-1, clause 7 with the following marking:

„DIN 4102 – B1, aufgebracht auf schwerentflammbar (DIN 4102-B1) Holzspanplatten“

- 6.2 The assessment in section 5 only applies to the coating system described in section 1 and tested as in section 3, applied to flame-retardant (DIN 4101-B1) particleboard - also veneered.

Used in connection with other materials its fire performance is likely to be influenced this negatively, that the given classification in section 5 is no longer valid.

Fire performance in connection with other materials is to be tested and classified separately.

- 6.3 According to DIN 4102-16: 20121, clause 7.2 for building materials that are intended to be used in outside conditions, it must be proven that the requirements for Baustoffklasse B1 ("schwerentflammbar") are met after a 2- and 5-years' weathering-period, too. This proof is not (yet) given.
- 6.4 The validity of the assessment in section 5 of this test certificate ends on 31. October 2028.
The period of validity may be extended upon application.
Verification testing is necessary for this purpose.
- 6.5 This test certificate does not replace an „allgemeines bauaufsichtliches Prüfzeugnis (abP)“ or an "allgemeine bauaufsichtliche Zulassung (abZ)" that may be required.

Abteilung Brandschutz
Referat Brandverhalten von Baustoffen

Der Prüfenieur

M.Sc. Sebastian B. Wachsmann



Der Leiter der Prüfstelle

Dipl.-Ing. (BA) Harald Schillo

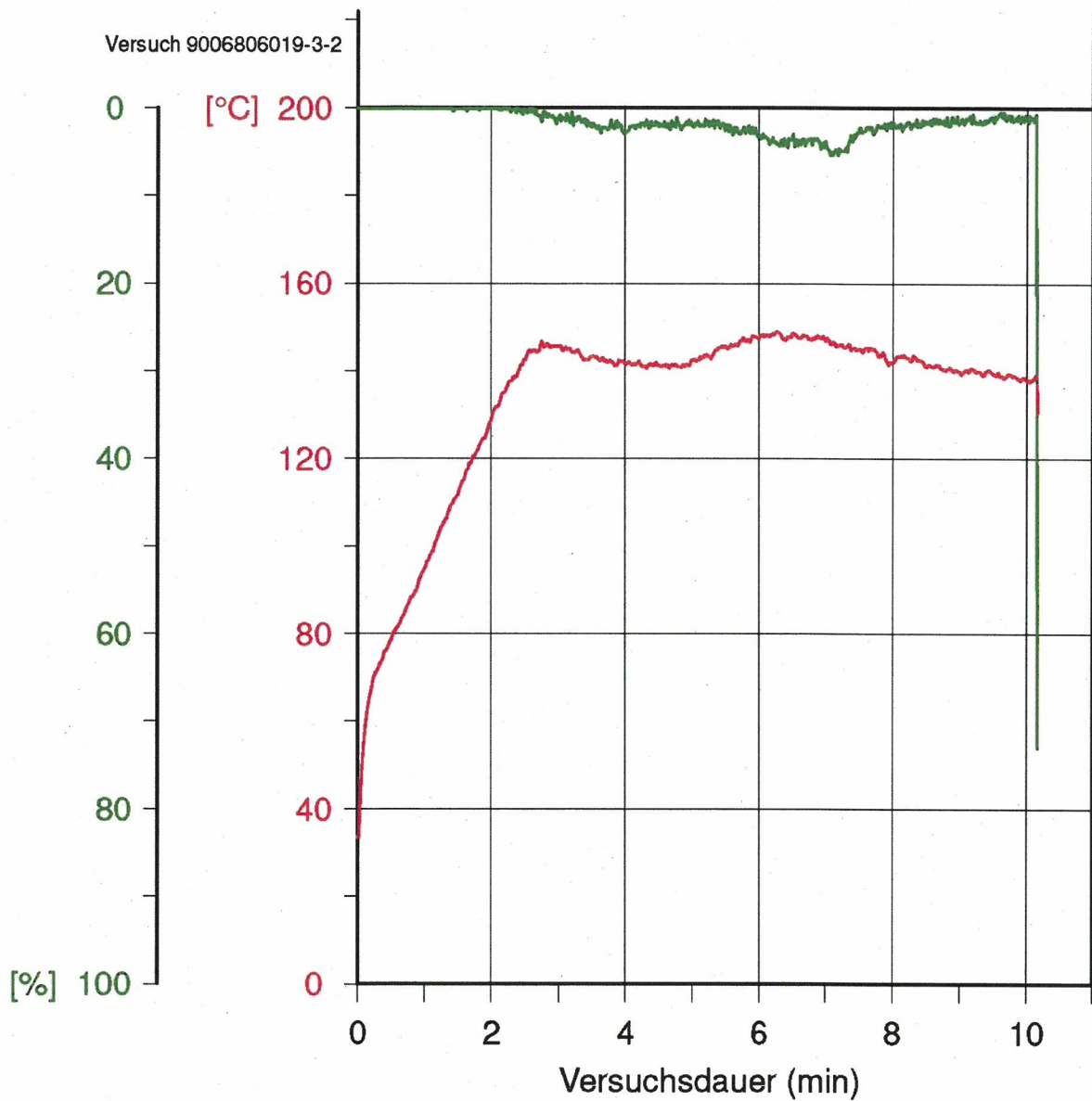


Abb. Verlauf des Brandschachtversuchs A321-19

max. Rauchgastemp.	149 °C
erreicht nach	6:17 min:sec
max. Rauchdichte	5 %
Integralwert	17 %*min



Figure 1: Results of fire shaft test A ("Brandschachtversuch"), (smoke density, flue gas temperature)

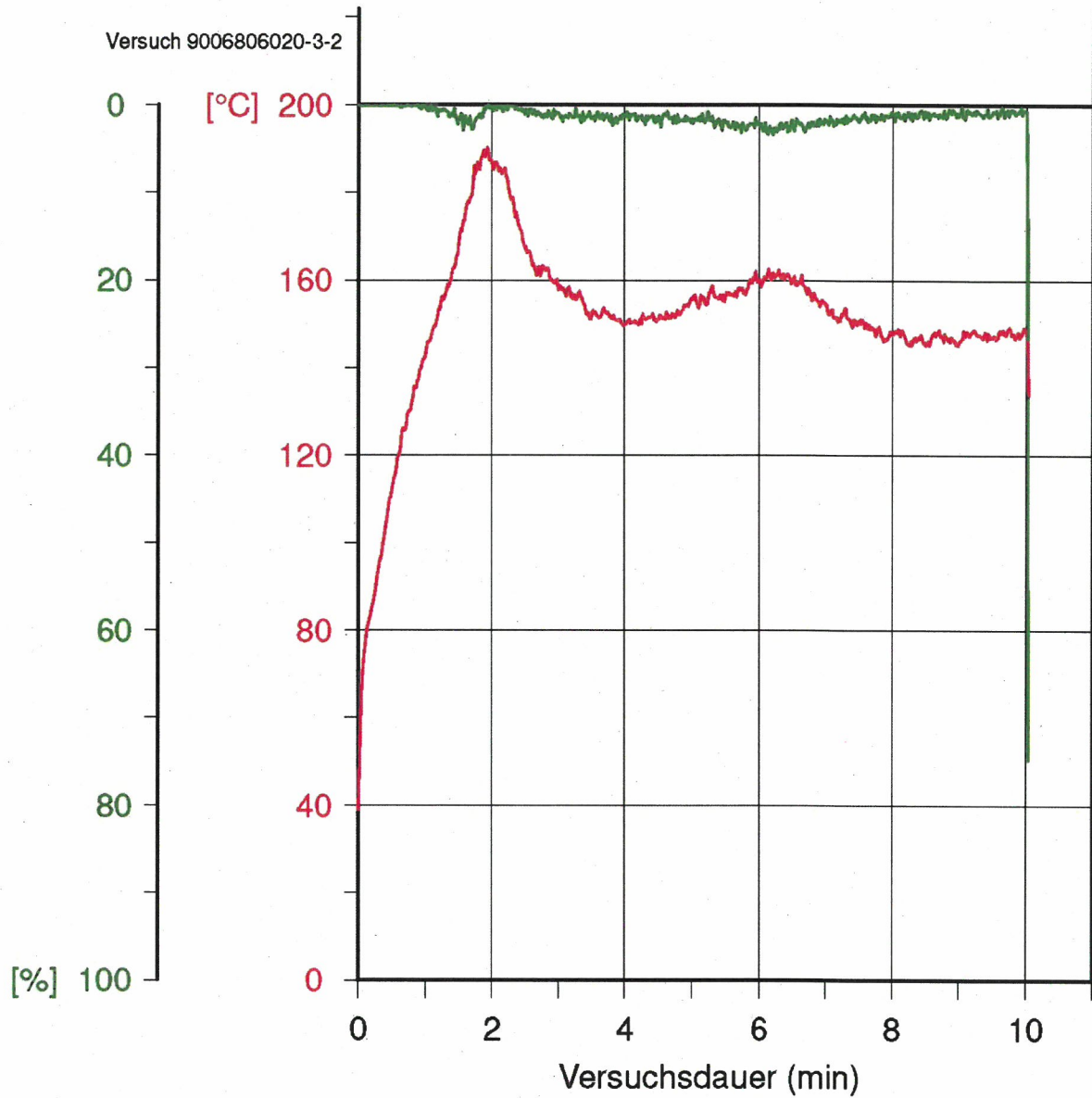


Abb. Verlauf des Brandschachtversuchs A321-20

max. Rauchgastemp.	190 °C
erreicht nach	1:56 min:sec
max. Rauchdichte	3 %
Integralwert	13 %*min



Figure 2: Results of fire shaft test A ("Brandschachtversuch"), (smoke density, flue gas temperature)

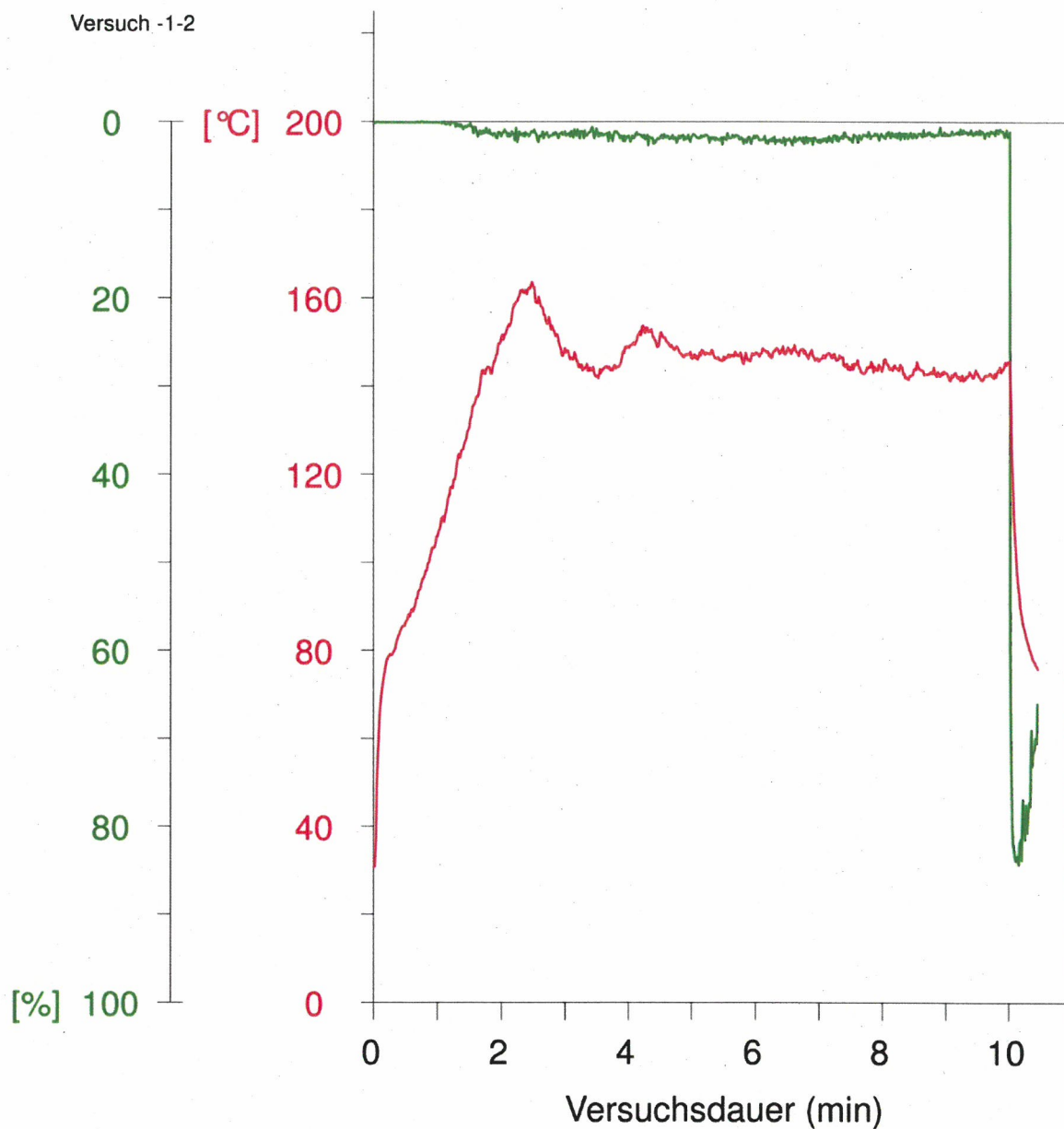


Abb. Verlauf des Brandschachtversuchs A321/21

max. Rauchgastemp. 164 °C

erreicht nach 2:29 min:sec

max. Rauchdichte 3 %

Integralwert 14 %*min

Figure 3: Results of fire shaft test A ("Brandschachtversuch"), (smoke density, flue gas temperature)



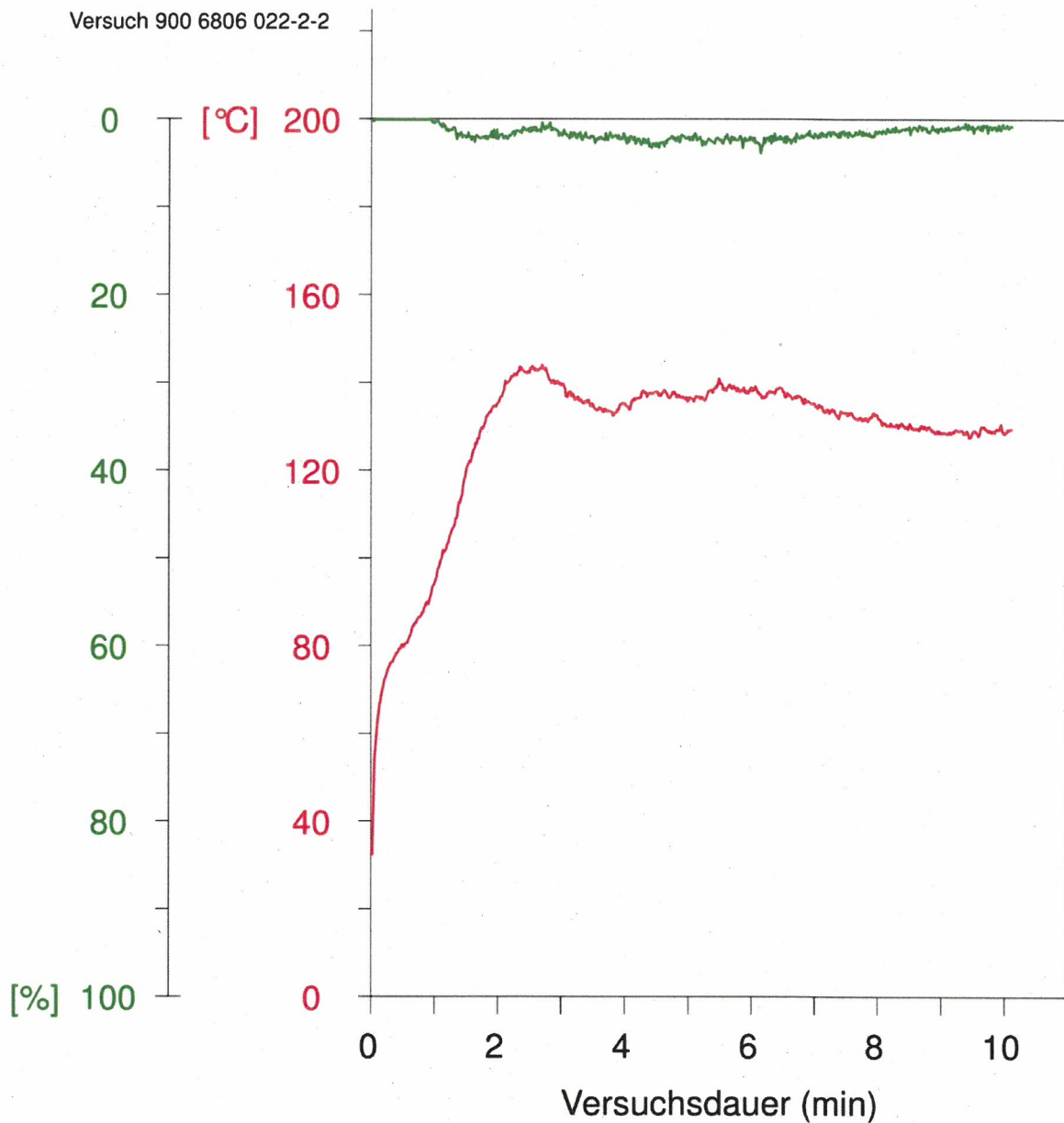


Abb. Verlauf des Brandschachtversuchs A321-22

max. Rauchgastemp. 144 °C

erreicht nach 2:42 min:sec

max. Rauchdichte 4 %

Integralwert 16 %*min



Figure 4: Results of fire shaft test A ("Brandschachtversuch"), (smoke density, flue gas temperature)

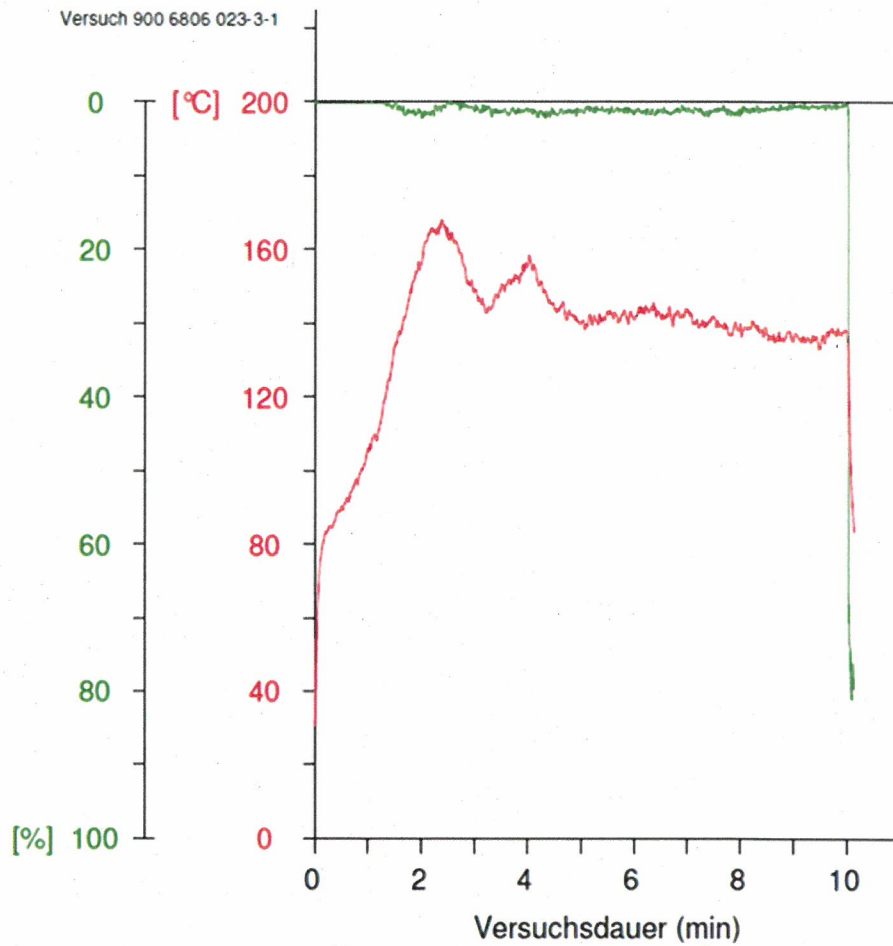


Abb. Verlauf des Brandschachtversuchs A321/23

max. Rauchgastemp.	168 °C
erreicht nach	2:23 min:sec
max. Rauchdichte	2 %
Integralwert	9 %*min

Figure 5: Results of fire shaft test A ("Brandschachtversuch"), (smoke density, flue gas temperature)

